Research Article

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What are the Costs of Oral Cancer in Serbia?

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ABSTRACT

Aim: The aim of this study was to determine the costs of the oral cancer treatment as a part of overall public health care costs in the Republic of Serbia according to International Classification of Diseases (ICD10),over the period 2010-2017.year.

Methodology: A retrospective, comparative analysis of healthcare statistics of oral cancers from the database of the Institute of Public Health of Serbia and financial indicators provided by the National Health Insurance Fund in the period 2010-2017. was performed. Descriptive statistics was used. Financial indicators and data on hospital services, outpatient services, home health care, ancillary health care services, drug consumption and medical devices were analyzed using System of health accounts methodology. A literature review on economic aspects of oral cancer treatment was performed and compared with this research data.

Results: This showed that Oral cancer accounts for about 2% of all cancer cases, but costs per those patients were twelve times more than average treatment costs for epidemiologically similar patients, with other type of cancer. Oral cancers leave a great deal of mutilation and affect negatively not only the quality of life of the patients, but also from the economic point of view, they represent a great burden, both for the individual and for the whole society. Treatment of oral cancer per patient per year in the public health providers in Serbia is estimated at 360.000,00 RSD, which totals costs of $3298 per patient per year.

Conclusion: Costs of the treatment of oral cancers in the Republic of Serbia in the period 2010-2017 increased more than 50%, while costs of overall public health care costs according to International classification of diseases increased around 30%. In order to get more comprehensive picture on economic aspects of the oral cancer treatment in Serbia, the accessibility of data on private health sector should be improved.

Introduction

As the part of research on financing and costs in the health care system, there is a growing interest in the disease estimation costs. This value represents a pressure that a particular disease or group of diseases burdens every society. The objective of this study was to determine the costs of the oral cancer treatment as a part of overall public health care costs in the Republic of Serbia according to International classification of diseases (ICD 10), over the period 2010-2017 year [1-5].

Material and Methods

Methodology

A retrospective, comparative analysis of healthcare statistics of oral cancers from the database of the Institute of Public Health of Serbia and financial indicators provided by the National Health Insurance Fund in the period 2010–2017. was performed. Descriptive statistics was used. Financial indicators and data on

hospital services, outpatient services, home health care, ancillary health care services, drug consumption and medical devices were analyzed using System of health accounts methodology. A literature review on economic aspects of oral cancer treatment was performed and compared with this research data.

Results

Results showed that during the observation period, the maximum cost of overall public healthcare in Serbia by main classification of ICD-10 was achieved in 2017 and it was RSD 204.780.509.984 (€1.688.911.422; $1.913.836.541) and the minimal cost was achieved in 2010– the amount being RSD 151,333,139,835 (€ 1,434,464,541; $1,908,843,843) (Table 1). Cost for neoplasms has risen from 15,137,321,516 RSD in 2010 to 23,838,866,084 RSD in 2017 year (Table 1).

Percentage share of overall public health care costs in the Republic of Serbia in the period from 2010 to 2017 per capita in dinars, euros and dollars is shown in the table below, as well as expenses per capita in dollars for oral cancer (Table 2). Treatment of oral cancer per patient per observed years in Serbia is estimated at 360.000,00 RSD, which totals average costs of $3298 per patient per year [6-11].

Table 1: Cost of illness from 2010. to 2017. in Serbia according to ICD 10 groups.

Year	Total costs (dinars (RSD))	Total costs (euro (€))	Total costs (dolar ($))	Costs for Neoplasms (dinars (RSD))
2010	151,333,139,835	1,434,464,541	1,908,843,843	15,137,321,516
2011	151,614,999,374	1,488,057,711	2,076,022,877	16,294,043,310
2012	166,972,893,694	1,477,505,475	1,898,282,102	16,778,057,210
2013	176,734,078,012	1,563,050,128	2,081,183,208	19,166,556,326
2014	183,189,009,509	1,547,596,600	1,875,591,374	19,448,490,697
2015	194,128,864,011	1,580,853,941	1,764,807,854	19,919,418,592
2016	197,355,206,780	1,604,513,876	1,794,138,243	23,032,312,506
2017	204,780,509,984	1,732,491,624	1,988,160,291	23,838,866,084

Table 2: Costs by main ICD 10 categories per capita in the period from 2010- 2017.

	2010	2011	2012	2013	2014	2015	2016	2017
Expenses per capita in dinars	20,178	20,887	23,251	24,669	25,686	27,360	28,032	29,088
Expenses per capita in euros	195	205	205	219	217	223	228	246,5
Expenses per capita in euros	259	286	264	291	263	249	253	280
Expenses per capita in euros	3,247	3,253	3,297	3,298	3,305	3,300	3,328	3,356

Note: Overall public healthcare in Serbia per major ICD 10 categories per capita have a growth trend from 259$ in 2010 to 280$ in. 2017 year.

Discussion

Comparing studies mostly explored parameters of direct costs for oral cancer treatment, as we did, like:

visits to selected physician, visits to specialists, laboratory tests, ultrasound and X-ray diagnostics (x'rays, CT scans, MRIs), costs for medicines and auxiliary products outside the hospital, in the hospital, prescription, costs without prescription, procedure-related costs of the operation, costs of staying in hospital and of clinical treatment, radiation and other treatments, implants, Home care, transportation of patient, rehabilitation [12]. Results showed that Oral cancer accounts for about 2% of all cancer cases in Serbia, but costs per those patients were twelve times more than average treatment costs for epidemiologically similar patients, with other type of cancer. Oral cancers leave a great deal of mutilation and affect negatively not only the quality of life of the patients, but also from the economic point of view, they represent a great burden, both for the individual and for the whole society. Average costs for treatment of oral cancer per patient observed in the period from 2010. to 2017. years in Serbia were 3298 dollars. Study "Epidemiology and cost analysis for patients with oral cancer in a university hospital in China" analyzed direct costs of patients with oral cancer, and epidemiological characteristics of patients, such as gender, type of cancer, clinical stage, living place, smoking.

The results showed a link with gender, age, smoking and the risk of suffering from oral cancer. The cost of treatment of male patients were significantly higher than that of a female patient and explains the higher proportion of patients suffering from squamous cell carcinoma in men, which proved to be more costly than adenocarcinoma. THE VANDERBILT AND THE UNIVERSITY OF ILLINOIS CHICAGO 2010-2012 STUDY has been found that the total annual costs for the treatment of patients with an oral, oropharyngeal cancer, and cancer of the salivary gland during the first year after diagnosis was ten times greater than that of patients epidemiologically similar, without this type of cancer ($ 79,151 compared to $ 7,419), that the average cost of treatment doubled when the patient receives all 3 types of treatment: surgical, radiation

and chemotherapy. They found that the key to cost reduction is in the early diagnosis, inclusion of screening as part of regular dental review of cancer (cancer can be detected in early stages and reduce morbidity and mortality from oral cancer).

In the „Oral cancer treatment costs in Greece and the effect of advanced disease" Greece study clinical data were used to calculate the direct costs of treatment. The average cost of treatment per patient in this study is estimated at $ 7,450, of which the cost of treatment I stage are estimated at $ 3,662 a stage IV at $ 11,467.

When costs for the treatment of oral cancer in Greece compared with gross domestic product per capita in the Greece, it was obvious that this treatment requires 65% of the annual average salary of inhabitants (8 monthly average wages). When we same calculation method applied in Serbia, results were similar (3300$) with findings received when calculation was based on direct costs.

Conclusion with Recommendation

Costs of the treatment of oral cancers in the Republic of Serbia in the period 2010-2017 increased more than 50%, while costs of overall public health care costs according to International classification of diseases increased around 30%. In order to get more comprehensive picture on economic aspects of the oral cancer treatment in Serbia, the accessibility of data on private health sector should be improved. All examined studies proved that the key to reducing the costs associated with the treatment of oral cancer lies in early diagnosis. Basic recommendations are:

a) Involvement of screening of oral cancer as part of a regular patient dental check-up, as this cancer can be detected early, and consequently reduce morbidity and mortality of oral cancer, as well as the economic burden of illness;

b) Establishment of an "electronic patient record", which would provide a good view of all patient data, preventive and other activities related to preservation of oral health, as well as the financial statements of the aforementioned activities;

c) Involvement of the private sector in keeping records of the activities undertaken in connection with oral cancers and to legally oblige them to introduce "Electronic card of the patient".

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